

### Claims

1. Bioactive rhenanite glass ceramic with crystalline phase and glass phase, characterized in that the crystalline phase contains rhenanite and the glass ceramic contains the following components

<u>Components</u>	<u>Amount (wt.-%)</u>
SiO <sub>2</sub>	29.5 to 70.0
CaO	5.5 to 23.0
Na <sub>2</sub> O	6.0 to 27.5
P <sub>2</sub> O <sub>5</sub>	2.0 to 23.5
F	0 to 1.5

and is essentially free from Al<sub>2</sub>O<sub>3</sub>.

2. Glass ceramic according to claim 1, which contains between 4 and 50 wt.-% rhenanite.
3. Glass ceramic according to claim 1 or 2, which contains between 10 and 50 wt.-% rhenanite.
4. Glass ceramic according to any one of claims 1 to 3, which contains the following components independently of one another in the following amounts:

<u>Components</u>	<u>Amount (wt.-%)</u>
SiO <sub>2</sub>	29.5 to 65.5
CaO	6.0 to 23.0 (in particular 11.0 to 23.0)
Na <sub>2</sub> O	7.0 to 25.5
P <sub>2</sub> O <sub>5</sub>	3.0 to 23.5 (in particular 5.5 to 23.5)
F	0.5 to 1.2.

5. Glass ceramic according to any one of claims 1 to 4, which contains the following components independently of one another in the following amounts:

<u>Components</u>	<u>Amount (wt.-%)</u>
SiO <sub>2</sub>	35.0 to 60.0
CaO	15.0 to 23.0
Na <sub>2</sub> O	9.0 to 25.5 (in particular 7.0 to 18.0)
P <sub>2</sub> O <sub>5</sub>	10.0 to 23.5 (in particular 10.0 to 20.0)
F	0.5 to 1.2.

6. Glass ceramic according to any one of claims 1 to 5, in which the weight ratio of Na<sub>2</sub>O : CaO is from 1.0 to 2.1 and the weight ratio of CaO : P<sub>2</sub>O<sub>5</sub> is from 0.9 to 2.2.
7. Glass ceramic according to any one of claims 1 to 5, in which the weight ratio of Na<sub>2</sub>O : CaO is from 0.8 to 2.0 and the weight ratio of CaO : P<sub>2</sub>O<sub>5</sub> is from 0.9 to 2.2.
8. Glass ceramic according to any one of claims 1 to 7, which additionally contains at least one of the following additional components:

<u>Additional Components</u>	<u>Amount (wt.-%)</u>
R <sup>(I)</sup> <sub>2</sub> O	0 to 15.0
R <sup>(II)</sup> O	0 to 4.0
R <sup>(III)</sup> <sub>2</sub> O <sub>3</sub>	0 to 10.0
R <sup>(IV)</sup> O <sub>2</sub>	0 to 10.0, in particular up to 1.0
Hal	0 to 2.0

wherein

R<sup>(I)</sup> represents a monovalent cation, in particular K or Ag  
R<sup>(II)</sup> represents a divalent cation, in particular Zn  
R<sup>(III)</sup> represents a trivalent cation, in particular B, Nb, Ta, Y, La or a lanthanoid,  
R<sup>(IV)</sup> represents a quadrivalent cation, in particular Ti, and

Hal represents a halogenid ion, in particular Br or I.

9. Glass ceramic according to any one of claims 1 to 8, in which the crystalline phase additionally contains at least one of the following crystalline components: sodium calcium silicate, apatite, sodium phosphate, sodium calcium phosphate and sodium potassium calcium phosphate.
10. Glass ceramic according to any one of claims 1 to 9, in which the rhenanite crystals are at most 10  $\mu\text{m}$  in size.
11. Glass ceramic according to any one of claims 1 to 10, in which the rhenanite crystals have an average size (numerical average) of 0.01 to 5.0  $\mu\text{m}$ .
12. Glass ceramic according to claim 11, in which the rhenanite crystals have an average size (numerical average) of 0.15 to 2.5  $\mu\text{m}$ , in particular 0.5 to 2.5  $\mu\text{m}$ .
13. Process for the production of a glass ceramic according to one of claims 1 to 12, in which:
  - a) a starting glass which contains the components of the rhenanite glass ceramic according to claim 1 or 8 is melted at temperatures of 1200°C to 1650°C,
  - b) the glass melt from a) is cooled,
  - c) optionally the cooled glass from b) is heat treated at temperatures of 600 to 1000°C, in particular 600°C to 980°C, for a period of 10 minutes to up to 10 hours, in particular up to 10 hours, in particular up to 8 hours, and
  - d) optionally the glass ceramic, which results from b) or c), is ground to a powder with a particle size of 100 nm to 100  $\mu\text{m}$ , in particular 1 to 50  $\mu\text{m}$ .

14. Shaped body which contains a glass ceramic according to any one of claims 1 to 12.
15. Shaped body which consists of a glass ceramic according to any one of claims 1 to 12.
16. Use of a glass ceramic according to any one of claims 1 to 12 or of a shaped body according to one of claims 14 or 15 as material for the reconstruction or restoration of bones or natural tooth material, or for promoting bone growth.
17. Bioactive composite material which comprises the glass ceramic according to any one of claim 1 to 12 and an organic compound.